# Boulder’s Ash Trees: Where to Next?

Jack Sandberg and Jacob Paul

### Background

The city of Boulder has an infestation of Emerald Ash Borers. These 1.5 inch long, foreign beetles are destroying the ash trees around Boulder. It is estimated that around 17% of the trees in Boulder are ash trees, and they are dying due to the EAB’s. The city has been taking several approaches to combat the EAB’s and their spread, such as cutting down infested trees, cutting down high-risk trees, spraying trees with repellant, and trying to educate the public about this issue. The city has mapped all of the public trees in Boulder, however one large issue that the city is running into is that around 80% of the ash trees belong on private property, which means that there are huge gaps in the database as to Ash trees. Also, the city cannot act on private trees, aside from cutting them down lest it seems like they may fall onto public land and/or hurt people.

### Questions we plan to answer:

* Can the data that the city of Boulder has already collected be extrapolated to make conclusions about all Ash trees in Boulder?
* Statistically, what trees are needed in certain areas to replace the dying Ash trees?
* What are other main types of trees that reside on non-city-owned property that have not been documented yet?
* Are there patterns in the locations of Ash trees that could help the city figure out how to address the EAB problem?

### Methods:

* Archival: We will use the data that the city of Boulder has already gathered to do statistical analysis and get a baseline of what the tracked tree inventory looks like.
* Observation(?): We will find parcels of land (either randomly selected or determined by accessibility) and gather data on what types of trees sit on that land. The types of data we collect will be influenced by types of data that the city already collected for the city tree canopy.
* Data Fusion: we will use the two datasets together to see if we can draw conclusions about the EAB problem in Boulder and see if the data accurately captures the problem on a wider scale.

### Expected Outcomes:

We expect a true, statistically sound answer on whether or not the data that the city has can be used to draw conclusions for the whole city and plan their tree management strategies accordingly. We will do this by comparing the data we collect to the data that the city of Boulder has collected. If these two datasets are similar in that the distribution of tree species is similar in the two datasets, we can conclude that the city can draw conclusions about the tree canopy of the entire city from the 25% that has already been collected. If these distributions are statistically different, we will be able to conclude that the city cannot confidently use the data they already have to get an idea of the problem on a city-wide scale.

### Justification

We believe that this project will succeed because we are using good, real data to perform analysis. We have data that we can interpret, which is rather open-ended, but also have our own research to do, which is more narrowed in terms of what we want to accomplish. We have set ourselves up to explore the problem and data, but we still have an outline to guide us. Also, since we have two methods planned, data fusion will let us combine our results and cross-check, which will help keep our data accurate. Having two methods will also keep our workload flowing, as we can always bounce ideas off of the other method and draw differing but complementary conclusions. Another reason that we will succeed is that we are both interested in the topic: this keeps us focused and wanting to learn and do more. Having interest in the topic makes us more invested and it means that we actually *want* to do this project.